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ABSTRACT

Projections to 1996-97 concerning Arkansas public high school graduates are examined. The state and county projections were prepared as a basic resource for institutions such as colleges and universities. Various considerations in projecting high school graduates are considered, including use of the Cohort Survival Technique, the importance of accuracy and comparability of data used as the base for projections, the problem of data availability for private schools, migration of students, fluctuations in the economy, stability of the survival rates, and increasing margins of errors as the number of years being predicted increases. Projections of high school graduates for Arkansas from sources other than the Arkansas Department of Higher Education (ADHE) are presented. These include projections from the Western Interstate Commission for Higher Education, Arkansas State University (Jonesboro), the University or Arkansas (Fayetteville), the the Arkansas Department of Education, and the Industrial Research and Extension Center. The ADHE state projections include increasing numbers of high school graduates in 1979-80 to a peak in 1981-82, followed by rather dramatic declines in 1985-86, followed by a momentary increase in 1988-89, another decline in 1990-91, and a somewhat erratic increase in 1996-97. These projections for the state show less percentage decline in high school graduates projected than were projected for the United States as a whole in the WICHE projections. (SW)

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PROJECTIONS TO 1996-97

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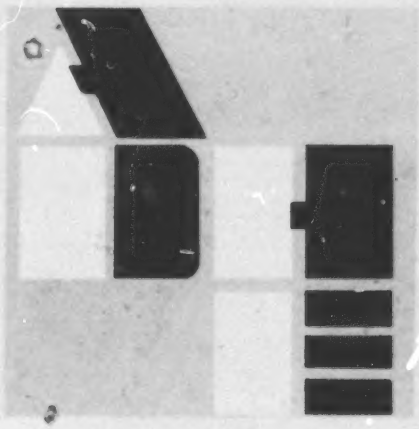

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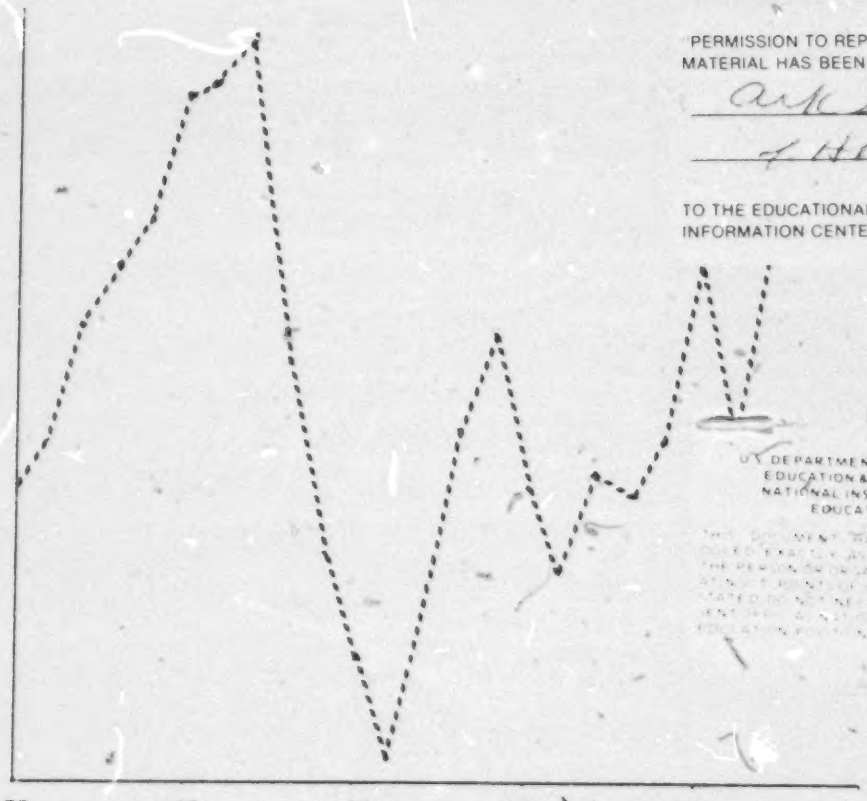

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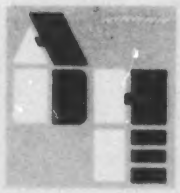

ARKANSAS PUBLIC HIGH SCHOOL GRADUATES, PROJECTIONS TO 1996-97

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April, 1981

FOREWORD

This report has been prepared by the staff of the Arkansas Department of Higher Education as a basic reference document for use by all those concerned with projections of future high school graduates in Arkansas. It is expected that these projections will be the basis for enrollment forecasts for Arkansas colleges and universities which are used for budgetary planning and other purposes until newer projections are appropriate. In addition, they may be used by the individual institutions in assessing their own probable futures, and may be of interest to other researchers and agencies of state government. The trend in high school graduates clearly has significant consequences for higher education planning. However, because the present report is intended as simply a reference document, those consequences are not explored herein. Future ADHE staff reports will include enrollment forecasts, for the state and for the individual institutions, and will fully discuss the implications for policy in Arkansas higher education.

As with any set of demographic projections, it is easier to critique the calculations than to improve them. Data limitations, intervening variables which have significant effects but which are difficult to anticipate, and the potential of totally unanticipated changes in anything from state policy to migration patterns could result in a future substantially different than these projections of the future. Nevertheless, in enrollment and high school graduate projections the best indicator of the future has always been the past, and the current projections are set forth with reasonable confidence that they are the best possible picture of the future which we can paint today.

Of special concern to some will be the county by county projections, especially in counties where substantial declines are anticipated. In any given instance persons at the local level may know of factors not taken into account in these projections which could make a significant difference. For example, a major industrial expansion in a county could result in substantial in-migration which would result in increased enrollment, and therefore graduates, of the public schools. Alternatively, of course, an unanticipated plant closing in another county could have similar, but opposite effects.

The authors of the several prior sets of projections of high school graduates were uniformly forthcoming and helpful to the authors of the present report. Especially helpful were William McConnell, Kenneth Cook, Stanley Williams, Truett Goatcher, Frank Troutman, and Forrest Pollard. The primary authors of this report are Dr. Tom Spencer and Ms. Deborah Brenske. Dr. Spencer conducted the basic research and analyses, and Ms. Brenske developed the 152 computer models which led to the final projections reported here. Ms. Wanda Cockrell and the ADHE production staff nursed the document through many revisions leading to this excellent end product. To all of these we express our graditude and acknowledge our

debt, but responsibility for the contents of this report, the current estimates, and any errors contained therein rest with the staff of the Arkansas Department of Higher Education.

T. Michael Elliott
Director
Arkansas Department of Higher Education
April 17, 1981

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EXECUTIVE SUMMARY

This report contains projections of Arkansas public high school graduates for the state as well as for each of the 75 counties based on births through 1979 and actual enrollments in numbers of graduates through 1979-80. The resulting projections of public high school graduates are through 1996-97 for the state and for the counties. This report was prepared as a basic resource for individuals interested in projections of high school graduates, especially those in institutions of higher education where projections of high school graduates are used as the basis for projections of enrollments at the instituions.

The various considerations in projecting high school graduates are discussed including use of the Cohort Survival Technique, importance of accuracy and comparability of data used as the base for projections, problem in availability of private school enrollments in Arkansas, migration of students, fluctuations in the economy, stability of the survival rates, increasing margins of errors as the number of years being predicted increases, and the size of the unit for which projections are to be made.

Projections of high school graduates for the state of Arkansas from sources other than the Arkansas Department of Higher Education (ADHE) are presented and discussed including projections from the Western Interstate Commission for Higher Education (WICHE), Arkansas State University--Jonesboro (ASUJ), the University of Arkansas--Fayetteville (UAF), the Arkansas Department of Education (ADE), and the Industrial Research and Extension Center (IREC).

The ADHE state projections are presented and the trends projected include increasing numbers of high school graduates from 29,052 in 1979-80 to a peak in 1981-82 of 29,411, followed by rather dramatic declines to a low of 25,114 in 1985-86, followed by a momentary increase to a total of 27,686 in 1988-89, another decline to 26,239 in 1990-91 and, finally, a somewhat erratic increase to 28,239 by the final year of the projections, 1996-97. These projections for the state of Arkansas, while lower than the 29,052 graduated in 1979-80, show less percentage decline in high school graduates projected than were projected for the United States as a whole in the WICHE projections.

The ADHE county projections are presented and wide fluctuations in patterns projected for the various counties are evident ranging from an increase of 75% for Baxter county by the end of the period being projected to a decrease of 50% for Lee county by the end of the period being projected. The general pattern of projected increases and decreases for the state and for the individual counties is for the highest projected increases to occur in the northern region of the state, the greatest projected decreases to occur in the east region of the state, decreases below the average for the state to occur in the northwest, southwest and metropolitan regions, and larger declines than projected for the entire state to occur in the east region, the northeast region, the south region, and the west central regions.

Arkansas Public High School Graduates, Projections to 1996-97

This report contains projections of Arkansas public high school graduates for the state as a whole as well as for each of the 75 counties based on births through 1979 and actual enrollments and numbers of graduates through 1979-80. The projections of public high school graduates are through 1996-97 for the state and the counties. This report was prepared as a basic resource for individuals interested in projections of high school graduates, especially those in institutions of higher education where projections of high school graduates are used as the basis for projections of enrollments at the institutions.

Considerations in Projecting High School Graduates

The most common approach used for projecting high school graduates is the cohort survival technique in which enrollments in each grade of elementary and secondary schools are compared to enrollments of surviving students in the next higher grade to determine a survival or retention ratio. Some average or projected survival ratio at each grade level is then used to project from the most recently available actual births or enrollments to yield predicted future enrollments or numbers of graduates. There are other basic projection methods, but all projections discussed in this report were made from some variation of the cohort survival technique. The cohort survival technique has the advantage of using readily available historical data on enrollments in elementary and secondary schools.

Accuracy and comparability of data used as the base for projections are obviously important. In Arkansas, enrollment data in public schools by county and for the state are relatively reliable and readily available. Such is not the case for enrollment data in private elementary and secondary schools since reporting of enrollment for private schools is voluntary and incomplete. All of the projections reported here, except the one by the Industrial Research and Extension Center (IREC), are based on public school enrollment only. If one wishes to expand state public school data to include an estimate of private school enrollment, the Arkansas Department of Education (ADE) estimates that there have been approximately a thousand graduates of private secondary schools per year in Arkansas in recent years. To make estimates of private school graduates at the county level would require careful local collection of enrollment information about private schools within the county and projection of trends at the county level. To repeat, private school graduates are not included in these projections.

The migration of students into or out of either the state or an individual county is effectively taken into consideration in the cohort survival technique to the extent that patterns of migration in the period being predicted are consistent with those in the period upon which calculations

are based. Changes in migration patterns which may occur in the future, but are not reflected in the base period, are not accounted for in the cohort survival projections presented here whether from other sources or calculated by the Arkansas Department of Higher Education (ADHE).

The effect of fluctuations in the economy on school enrollments is a topic meriting further study. At the college level there appears to be a relationship between the percentage of unemployment within the state and enrollment in Arkansas institutions of higher education. Sufficient analysis of the relationship between unemployment and secondary school enrollment has not been completed, but it appears likely that the relationship is also present at the secondary level. Thus, one of the considerations involved in projecting high school graduates is the state of the economy in the base period and its anticipated condition in the period being projected.

Another consideration in the projection of high school graduates is the stability of the survival or retention rates. Arkansas public schools seem to be retaining a larger percentage of their students through high school and this improved holding power is reflected in a survival or retention rate which has been improving over the last several decades. Therefore, there is a question about how long a base period should be used and even if increased survival ratios should be used in the future. Further, there are fluctuations in survival ratios from year to year which make use of the most recent ratio questionable. The projections presented here use several approaches on this issue. One uses only four ratios (covering 5 years) and even counts more recent years more heavily than less recent years. This practice yields higher high school graduate projections. Another projection uses 13 ratios (covering 14 years) and averages all ratios equally. This practice yields lower graduate projections.

Minor fluctuations in the survival or retention ratios used for predictions have increasing impacts as the numbers of years being predicted increase. For short-term decision-making, it is preferable that high school graduates be projected regularly and that projections not be made for a longer period than is necessary. However, for strategic planning purposes, it is useful to examine projections for the longer term, from time to time, and this report is intended to address both needs.

The unit for which projections are to be made is still another consideration. The more individuals or units being included, the smaller the margin of error is generally expected to be. For example, the total enrollments at all of the colleges and universities in Arkansas can be projected with a higher degree of accuracy than is normal for projected enrollments at individual institutions. There is sufficient variation in institutional images and practices to produce significant changes in an individual institution's enrollments from year to year, even though the variances among institutions tend to cancel out when total enrollments for all all institutions are projected. The same principle applies to projecting numbers of high school graduates for each of the seventy-five counties in Arkansas and the projection of high school graduates for the entire state. It is reasonable to expect that over a longer period of time, greater changes in birth rates and rates of in- or out-migration

will occur among individual counties and that there will be a significantly larger percentage of error in the projections of numbers of high school graduates in individual counties than will occur in projections of numbers of high school graduates for the entire state. Possibly because of this principle, no other prognosticators were found who had projected numbers of high school graduates for the individual counties within the State of Arkansas and most individuals involved in such types of projections caution that individual county totals, especially as the projections extend far out into the future, should be viewed with caution.

All of these considerations are involved in the projections of high school graduates by ADHE and by others which are presented in this report. The next section will present the other projections and describe how the various considerations were handled in each instance.

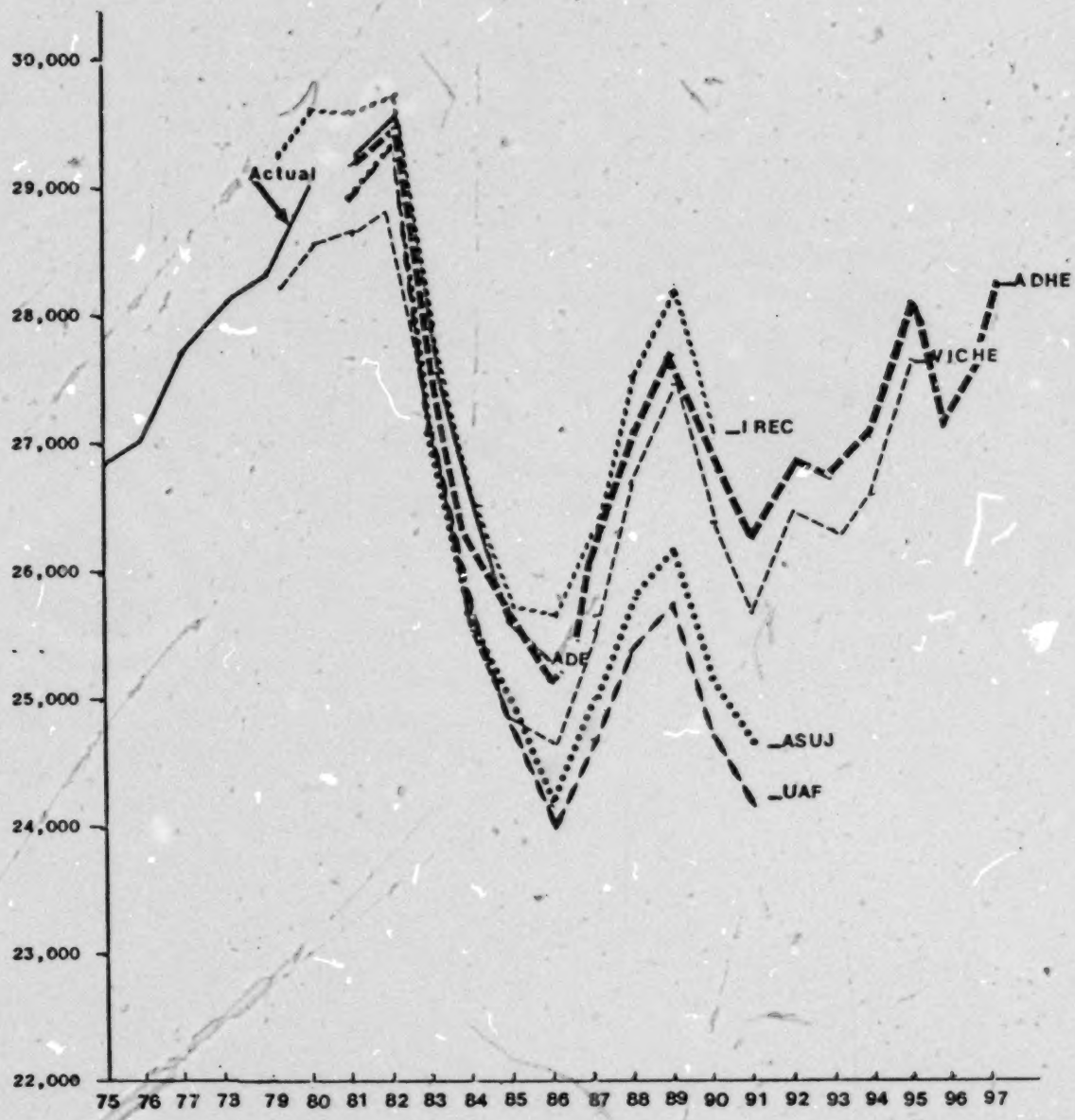
Other Projections of Graduates

Figure 1 and Table 1 are used to display five sets of projections of high school graduates for the State of Arkansas prepared by several institutions and agencies and the current ADHE projections. These other sets of projections are presented to provide a framework for viewing the ADHE projections as well as for comparisons of the effects of various kinds of assumptions on the resulting projections.

To date, the most widely used set of projections of high school graduates in Arkansas, and the set which extends for the greatest number of years, is that developed under the leadership of William McConnell of the staff of the Western Interstate Commission for Higher Education (WICHE). These were published as High School Graduates: Projections for the Fifty States. The WICHE projections were completed in 1979 and are based on births, actual enrollments and graduate numbers through 1977-78. The WICHE projections are the only ones presented here which used fall enrollments rather than the total yearly enrollments used in all the other projections. The fall enrollments used in the WICHE projections are the enrollments as of October 1 of each year while the total yearly enrollments used in the other projections represent all students who enroll at any time in a school year, unless a student arrives from another Arkansas school system. It does not appear that the use of fall enrollments produces a significant difference from the use of total yearly enrollments. This is a cohort survival projection in which ratios were calculated between enrollments in each grade and enrollments in the following grade in the subsequent year. The relationships between live births and first grade enrollments six years later were also calculated. By adding births to the process, projections were made for eighteen years. The survival rates used for projecting future years in this study were determined after reviewing historical survival rates over many years. The rates that were used are not averages of a given number of years, but were selected as what the researchers felt would be the most likely ratios in the period to be projected. The ratios used tend toward the ratios in the most recent years for which data was available.

The Arkansas State University--Jonesboro (ASUJ) and the University of Arkansas--Fayetteville (UAF) projections presented are cohort survival

FIGURE 1: ARKANSAS HIGH SCHOOL GRADUATES, COMPARISON OF PROJECTIONS



*Years shown are end of academic years. (For example, 1979 is 1978-79)

TABLE 1. COMPARISON OF PROJECTIONS OF ARKANSAS HIGH SCHOOL GRADUATES

	ACTUAL	PROJECTED					
YEAR		WICHE	ASUJ	UAF	ADE	IREC	ADHE
1974-75	26,836						
1975-76	27,029						
1976-77	27,719						
1977-78	28,087						
1978-79	28,302	28,151				29,231	
1979-80	29,052	28,565				29,610	
1980-81		28,622	28,927	28,959	29,265	29,577	29,154
1981-82		28,765	29,292	29,335	29,520	29,608	29,411
1982-83		26,963	27,082	27,053	27,567	27,879	27,491
1983-84		25,531	25,733	25,649	26,413	26,519	26,347
1984-85		24,817	24,908	24,738	25,808	25,672	25,735
1985-86		24,659	24,207	23,990	25,290	25,625	25,114
1986-87		25,449	24,977	24,676		26,328	26,064
1987-88		26,662	25,767	25,380		27,528	27,095
1988-89		27,437	26,153	25,732		28,155	27,686
1989-90		26,355	25,127	24,694		27,080	26,757
1990-91		25,681	24,662	24,195			26,239
1991-92		26,448					26,839
1992-93		26,296					26,716
1993-94		26,582					27,005
1994-95		27,638					28,080
1995-96							27,080
1996-97							28,239

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projections based on 1979-80 actual enrollments and graduates and extend forward for 12 years. It should be noted that these two projections have the longest base periods and, therefore, the lowest survival ratios and projections among the group presented here. The ASUJ projections, developed under the leadership of Stanley Williams, used a 12 year base period. The UAF projections, developed by Kenneth Cook, were based on 14 years of actual data. A review of enrollment trends over that base period indicates a general increase in survival ratios. For this reason, the use of a longer base period to calculate mean ratios yields understandably conservative estimates of future graduates.

The ADE projections, developed by Truett Goatcher, are also based on a cohort survival technique. Five years of actual data were used with 1979-80 being the most recent year. The five years of data used provide four survival ratios. It is important to note that the ADE technique places more weight on the most recent years' survival ratios rather than a simple averaging of the survival ratios over that period. The ADE projections extend into the future only five years, but the weighting of recent years results in the ADE projections being the highest among those using only public school enrollments.

The IREC projections are different from all others presented here in that a special effort was made to include enrollments in private schools in the state whereas all the other studies reported here used only public school enrollments. The IREC projections were developed by Frank Troutman. The projections in the IREC study were made through a survival technique using five years of data and the average of four annual ratios. The IREC projections used actual data through 1977-78.

The ADHE State Projections

The ADHE state projections are also shown in Figure 1 and Table 1. The complete set of state historical data, survival ratios, and projections of all grades and graduates for each year are shown in Table 4 which is placed in the Appendix. The ADHE state projections were also calculated using a cohort survival technique. The base period included six years of data or five ratios and the ratios used for projections were the weighted average of the ratios for the previous five years. The last year of actual data utilized was 1979-80 enrollments provided by ADE and 1979 live births provided by the Arkansas Department of Health (ADH).

In order for the ADHE projections to be extended to eighteen years, a ratio was used to move from live births to first grade enrollments six years later. Note that the birth data for 1976, 1977, and 1978 fluctuate more than has been common. ADH personnel stated that due to technical problems, the birth data for the 1976 to 1978 period is less reliable, but that the 1979 data is reliable. Thus the projections of graduates for 1993-94, 1994-95, and 1995-96 should also be less reliable.

Since projections based on larger units are usually believed to be more reliable, the state projections were made independent of the county projections. There is a discussion of the comparison between the state projections and the total of the county projections later in this report.

Several caveats about the ADHE state projections must be offered. The most recent years used in the base period for these projections are years of unusually high unemployment which could relate to unusually high enrollments, especially at the secondary level. The result of the recent economic conditions could well be over-projection of graduates in the future. Similarly, the base period was one of significant net in-migration for the State of Arkansas which is different from the state experience from about the 1920's to the 1960's. Any change in the migration pattern will affect the high school graduate projections. There were also changes in public school practices regarding special education students in the base period used. In recent years the mainstreaming of special education students has increased the ratios between the grades, but in slight and undetermined amounts. Finally, the projections here include only public high school graduates.

Examining the actual data of about twenty years, it was apparent that the ratios between the grades had improved significantly. While it was impossible to separate the factors involved in the improvement in ratios, special efforts were made to compare the retention in Arkansas to the national rates. The 1959-60, 1969-70, and 1979-80 graduates were compared to the numbers in the 18 year age group in those same years. The 1960 and 1970 age group data were from census data. The 1980 age group data was estimated with the assistance of Forrest Pollard of IREC and reference to preliminary 1980 census data. In 1959-60, the Arkansas graduates were 67.3% of the 18 year age group; in 1969-70, 70.3%; and in 1979-80, the graduates were 72.7% of the estimated 18 year age group. The improvement in the percentage of Arkansas graduates to 18 year olds is remarkable, and it compares favorably to an estimated national figure of 74.3%. The National Center for Educational Statistics (NCES) predicts that the national rate will stabilize for the 1980's at about 74.3%. While the state projections by ADHE do not involve an improvement of this effective net retention or graduation rate, the effect of continuing to improve the Arkansas rate until it reached the national rate would increase the projected number of graduates from 1986-87 to 1996-97 by approximately 600 per year.

To summarize the effects of various factors on the numbers of high school graduates in Arkansas, factors likely to make the ADHE projections high are the base period economic conditions, net in-migration, and changes in special education. The possibility of continued improvement in the retention of students in the public schools could make the ADHE projections low. Changes in practices in the public schools, such as higher minimum standards for graduation or more effective remedial programs, could also affect accuracy of the ADHE projections, obviously in opposite directions.

The ADHE County Projections

The ADHE county projections are shown in Table 2. The techniques for the ADHE county projections are identical with those used for the ADHE state projections that were made through a cohort survival technique using a six year base period (five ratios), and the weighted average of the ratios for projections into the future. The last year of actual data

TABLE 2. ARKANSAS HIGH SCHOOL GRADUATES BY COUNTY: ACTUAL, 1979-80 AND PROJECTED, 1980-81 THROUGH 1996-97

YEAR	ARKANSAS COUNTY	ASHLEY COUNTY	BAXTER COUNTY	BENTON COUNTY	BOONE COUNTY	BRADLEY COUNTY	CALHOUN COUNTY	CARROLL COUNTY	CHICOT COUNTY	CLARK COUNTY
1979-80	337	377	283	890	360	211	107	195	243	262
1980-81	281	355	317	886	385	206	95	181	232	284
1981-82	336	384	304	880	353	185	83	189	214	261
1982-83	280	336	298	779	374	147	83	174	235	249
1983-84	278	331	272	848	369	175	90	175	199	216
1984-85	275	363	291	801	346	143	73	171	172	227
1985-86	233	323	301	860	334	161	83	152	185	212
1986-87	242	349	352	883	343	157	89	197	177	242
1987-88	266	327	334	1,011	406	138	79	190	147	242
1988-89	259	364	375	1,010	421	147	84	183	166	253
1989-90	251	349	298	1,007	396	156	72	187	157	232
1990-91	213	310	316	940	366	152	80	164	168	247
1991-92	250	281	434	941	399	146	83	195	170	224
1992-93	236	298	458	1,028	380	125	73	187	155	194
1993-94	241	321	486	991	387	143	63	217	173	211
1994-95	266	316	572	1,087	424	166	72	200	140	209
1995-96	270	314	430	1,009	425	139	74	206	148	233
1996-97	246	335	495	902	425	165	88	250	170	213

TABLE 2. CONTINUED

YEAR	CLAY COUNTY	CLEBOURNE COUNTY	CLEVELAND COUNTY	COLUMBIA COUNTY	CONWAY COUNTY	CRAIGHEAD COUNTY	CRAWFORD COUNTY	CRITTENDEN COUNTY	CROSS COUNTY	DALLAS COUNTY
1979-80	264	172	122	409	264	723	456	642	312	160
1980-81	256	192	116	390	299	744	439	589	326	146
1981-82	281	189	112	366	299	733	445	615	310	131
1982-83	216	162	116	332	296	758	456	579	295	148
1983-84	231	187	111	356	299	679	411	560	288	117
1984-85	203	175	89	336	260	660	427	569	294	133
1985-86	201	181	111	292	227	660	425	518	232	127
1986-87	212	180	119	313	253	657	450	549	294	126
1987-88	210	194	109	323	288	687	476	563	256	127
1988-89	191	181	120	336	277	790	473	541	274	139
1989-90	203	201	118	302	260	702	469	504	270	157
1990-91	175	203	95	283	302	686	479	500	270	143
1991-92	213	215	121	284	294	724	540	490	282	128
1992-93	196	199	80	273	274	716	536	489	246	121
1993-94	220	249	109	280	245	713	565	484	248	106
1994-95	215	227	113	310	293	733	615	514	284	140
1995-96	188	242	111	304	265	710	640	491	257	142
1996-97	200	272	108	338	286	773	690	434	235	149

TABLE 2. CONTINUED

YEAR	DESHA COUNTY	DREW COUNTY	FAULKNER COUNTY	FRANKLIN COUNTY	FULTON COUNTY	GARLAND COUNTY	GRANT COUNTY	GREENE COUNTY	HEMPSTEAD COUNTY	HOT SPRING COUNTY
1979-80	230	229	536	241	124	806	260	404	283	369
1980-81	313	226	592	237	131	785	224	405	262	357
1981-82	284	250	593	243	118	797	257	405	290	385
1982-83	289	215	562	246	116	759	237	390	260	353
1983-84	245	198	561	193	117	744	233	333	246	341
1984-85	227	197	579	200	121	676	217	326	252	344
1985-86	232	206	535	213	108	663	242	324	276	341
1986-87	230	212	647	241	114	666	258	370	252	312
1987-88	299	226	654	227	113	744	245	380	272	382
1988-89	240	208	697	216	121	731	274	392	285	384
1989-90	244	209	701	244	127	684	269	374	275	359
1990-91	215	212	763	244	94	644	251	354	288	347
1991-92	226	205	713	198	114	708	324	444	279	343
1992-93	206	212	694	224	115	682	300	389	284	368
1993-94	226	232	693	243	124	706	274	398	271	343
1994-95	240	241	787	232	129	717	296	461	277	395
1995-96	220	245	790	229	121	748	380	425	318	410
1996-97	242	236	793	255	123	734	301	469	329	395

TABLE 2. CONTINUED

YEAR	HOWARD COUNTY	INDEPENDENCE COUNTY	IZARD COUNTY	JACKSON COUNTY	JEFFERSON COUNTY	JOHNSON COUNTY	LAFAYETTE COUNTY	LAWRENCE COUNTY	LEE COUNTY	LINCOLN COUNTY
1979-80	181	326	138	248	1,219	183	131	235	214	195
1980-81	193	374	122	279	1,149	178	125	232	164	185
1981-82	220	384	123	279	1,250	215	139	250	174	174
1982-83	184	357	127	235	1,197	185	124	236	198	156
1983-84	202	353	123	228	1,139	162	106	213	217	143
1984-85	178	348	113	208	1,084	187	123	228	166	147
1985-86	157	383	107	192	1,011	180	97	185	165	132
1986-87	185	355	129	201	983	186	105	216	156	138
1987-88	193	421	136	201	1,046	206	114	210	146	148
1988-89	197	405	114	191	1,105	217	110	223	138	144
1989-90	189	399	115	183	1,034	197	105	219	126	138
1990-91	194	410	122	188	1,085	215	98	232	131	138
1991-92	190	416	120	203	978	230	107	209	136	131
1992-93	219	373	144	184	981	207	101	232	130	127
1993-94	191	418	116	179	930	193	114	223	137	131
1994-95	214	497	122	201	972	227	111	207	128	136
1995-96	189	481	144	188	1,064	253	88	217	106	152
1996-97	210	458	132	198	1,086	217	105	216	108	139

TABLE 2. CONTINUED

YEAR	LITTLE RIVER COUNTY	LOGAN COUNTY	LONOKE COUNTY	MADISON COUNTY	MARION COUNTY	MILLER COUNTY	MISSISSIPPI COUNTY	MONROE COUNTY	MONTGOMERY COUNTY	NEVADA COUNTY
1979-80	216	263	483	168	129	482	708	216	83	153
1980-81	207	253	503	134	129	483	726	276	97	154
1981-82	195	243	503	150	128	507	739	226	83	167
1982-83	187	226	501	138	113	487	690	196	98	139
1983-84	169	230	449	126	135	492	648	189	84	129
1984-85	174	218	489	106	156	485	633	165	89	154
1985-86	206	185	450	133	155	448	602	179	80	131
1986-87	203	197	517	128	153	458	590	137	74	165
1987-88	203	209	517	139	173	463	626	148	88	177
1988-89	218	214	544	152	171	472	653	168	97	154
1989-90	198	212	523	132	194	490	651	141	91	218
1990-91	220	200	520	133	186	440	601	162	79	185
1991-92	194	214	597	148	171	393	615	137	77	164
1992-93	189	226	590	170	206	402	632	157	93	148
1993-94	176	226	584	161	210	431	561	144	76	161
1994-95	189	212	582	155	262	443	683	147	91	177
1995-96	210	214	621	179	196	452	589	155	77	201
1996-97	191	185	660	164	210	468	602	149	84	165

TABLE 2. CONTINUED

YEAR	NEWTON COUNTY	OUACHITA COUNTY	PERRY COUNTY	PHILLIPS COUNTY	PIKE COUNTY	POINSETT COUNTY	POLK COUNTY	POPE COUNTY	PRAIRIE COUNTY	PULASKI COUNTY
1979-80	88	410	86	471	141	356	195	466	156	4,035
1980-81	82	444	91	485	117	359	227	507	142	4,201
1981-82	92	424	105	414	148	377	224	516	135	4,239
1982-83	95	396	85	399	118	319	210	464	130	4,000
1983-84	78	363	88	411	116	330	173	443	118	3,608
1984-85	104	333	78	352	108	287	183	495	115	3,785
1985-86	84	395	79	350	117	285	210	459	96	3,562
1986-87	76	366	73	346	117	284	204	438	115	3,834
1987-88	190	370	102	357	129	281	190	508	105	3,982
1988-89	97	403	92	335	118	301	198	484	111	4,138
1989-90	86	380	95	332	132	261	187	471	99	4,055
1990-91	87	348	75	301	155	241	182	507	107	4,008
1991-92	99	336	84	314	121	262	213	529	92	4,216
1992-93	86	351	75	320	130	255	198	459	99	4,056
1993-94	90	316	74	285	108	242	188	495	93	3,916
1994-95	121	353	89	320	138	279	241	545	99	4,093
1995-96	96	348	107	308	137	245	192	551	107	3,196
1996-97	109	373	72	289	149	249	211	485	86	4,168

TABLE 2. CONTINUED

YEAR	RANDOLPH COUNTY	SALINE COUNTY	SCOTT COUNTY	SEARCY COUNTY	SEBASTIAN COUNTY	SEVIER COUNTY	SHARP COUNTY	ST. FRANCIS COUNTY	STONE COUNTY	UNION COUNTY
1979-80	205	612	124	116	1,141	159	220	471	128	615
1980-81	192	553	114	122	1,285	170	195	448	131	589
1981-82	201	674	122	125	1,151	152	223	438	124	614
1982-83	192	591	104	109	1,068	136	200	495	132	559
1983-84	226	568	106	111	1,064	142	198	401	133	553
1984-85	179	520	89	106	890	162	203	386	128	505
1985-86	199	541	98	116	1,003	139	186	386	134	508
1986-87	190	584	104	102	1,047	153	230	370	135	518
1987-88	183	645	105	103	1,039	149	240	384	131	555
1988-89	199	647	110	103	1 058	153	257	366	130	527
1989-90	207	618	111	92	1,016	142	251	335	128	511
1990-91	182	559	79	91	1,040	154	250	320	135	533
1991-92	258	574	101	96	1,034	149	265	329	173	511
1992-93	244	583	87	121	1,263	132	303	347	171	533
1993-94	218	530	81	87	1,07?	129	329	342	181	486
1994-95	199	681	89	108	1,091	147	322	362	167	551
1995-96	225	700	89	96	1,044	158	319	352	170	553
1996-97	274	719	80	109	1,101	164	333	345	167	593

TABLE 2. CONTINUED

YEAR	VAN BUREN COUNTY	WASHINGTON COUNTY	WHITE COUNTY	WOODRUFF COUNTY	YELL COUNTY
1979-80	139	1,254	616	131	254
1980-81	152	1,308	678	143	257
1981-82	165	1,284	638	131	278
1982-83	160	1,105	597	141	223
1983-84	163	1,134	574	142	229
1984-85	162	1,137	605	116	200
1985-86	169	1,112	559	120	178
1986-87	164	1,135	598	126	200
1987-88	188	1,179	612	133	215
1988-89	200	1,200	646	134	224
1989-90	199	1,142	595	133	206
1990-91	188	1,128	605	139	198
1991-92	200	1,155	628	126	197
1992-93	258	1,099	611	129	202
1993-94	228	1,068	592	126	181
1994-95	257	1,275	631	128	191
1995-96	231	1,193	634	119	164
1996-97	234	1,291	704	137	176

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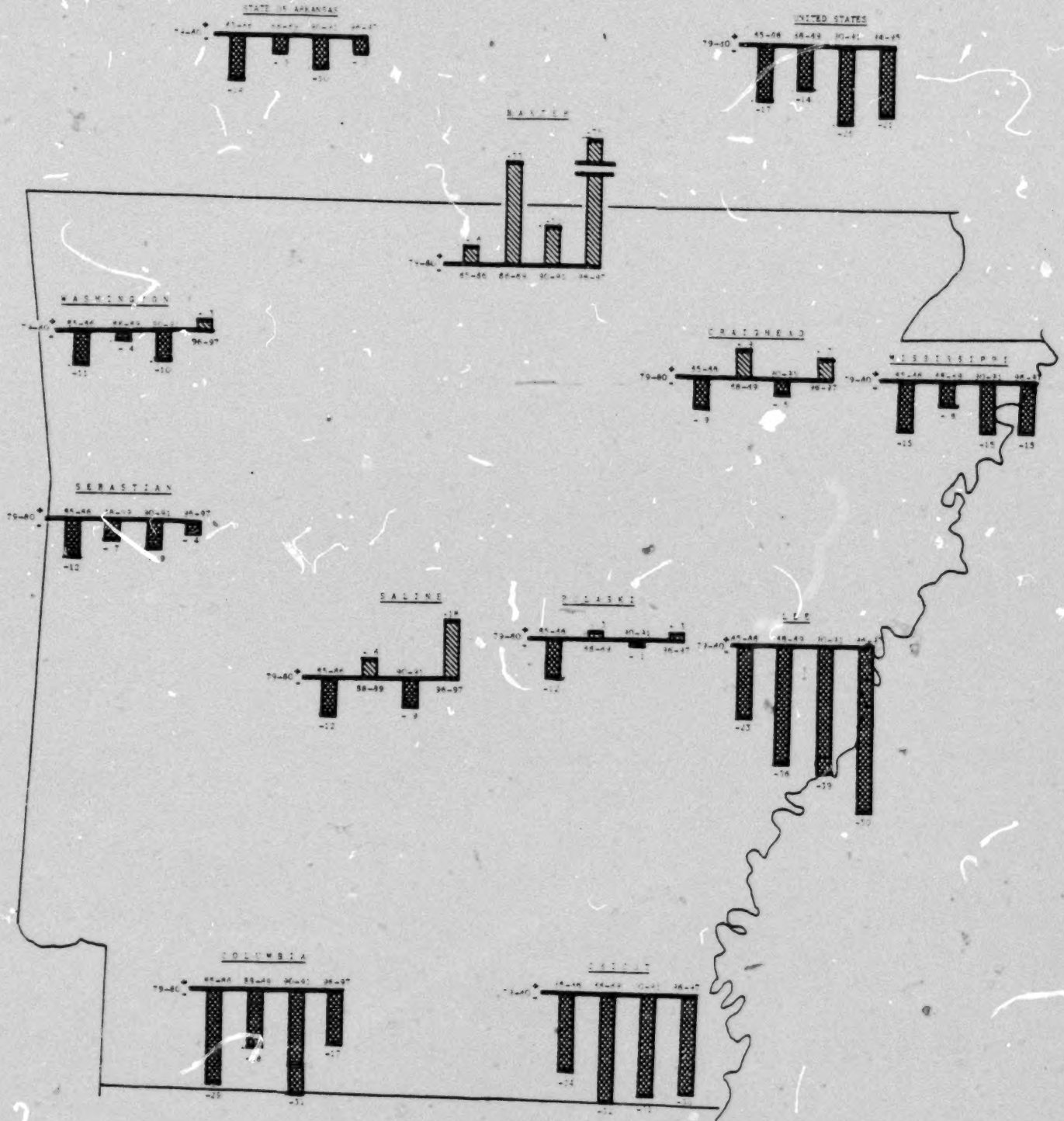
utilized was 1979-80 enrollments provided by ADE and 1979 live births provided by ADH.

All of the caveats made in the previous section regarding the ADHE state projections apply to the ADHE county projections and, in fact, the county projections should be used with even more restraint than is necessary with the state projections. The assumptions unavoidably built into the projection technique at the county level, those relating to economic conditions, migration, special education practices, the retention of students, and other practices in the public school systems, are likely to be less stable at the county level than would be true at the state level.

The projections presented for each county in Table 2 follow relatively smooth patterns which logically relate to recent conditions in that county. However, it should be noted that there were instances where the public school data for a particular county contained entries in one or more grades for a particular year that appeared unreasonable. In these instances, the ratios affected by the apparently aberrant data were ignored for that particular year so that the average survival ratio used might be based on fewer than five annual ratios. The greatest data problems at the county level are the live birth figures for the years 1976, 1977, and 1978, which are the bases for the graduate projections for the years 1993-94, 1994-95, and 1995-96. For example, the 1976 live births by county of residence total 33,381 even though the state total of live births for 1976 is reported as 34,651. Further, the 1977 state live birth total appears higher than is reasonable and the 1978 live birth total appears lower than is reasonable. ADH staff acknowledge problems with the live birth data for these three years and report inability to properly reconstruct those data. On the other hand, ADH staff express confidence in the reliability of the 1979 live birth data. There were adjustments made to the numbers of graduates in four counties in 1995-96 and one county in 1996-1997 because the live birth figures for the corresponding years for those counties appeared abberant. Therefore, the high school graduate projections for the 1993-94, 1994-95, 1995-96 school years should be used with even more caution than is necessary for other years.

Figure 2, which compares changes in numbers of graduates between 1979-80 and the four selected years of 1985-86, 1988-89, 1990-91, and 1996-97, is presented to show the differences in projected trends in the 75 Arkansas counties. These years were selected based on the patterns in Figure 1 where 1985-86 is the lowest year of the early '80s decline, 1988-89 is the peak of the late '80s increase, 1990-91 is the bottom of another decline and 1996-97 is the last year projected. Table 5, which shows comparable percentage figures for all counties, is in the Appendix. In Figure 2 the bar graphs represent the percent change from the actual 1979-80 graduates which are projected for the individual counties for each of the selected years. For example, Baxter County is projected to have 6% more graduates in 1985-86 than in 1979-80, 33% more graduates in 1988-89 than in 1979-80, and a dramatic 75% more graduates in 1996-97 than in 1979-80. This contrasts sharply with the projections for Lee County where graduates are projected to decline steadily, ending with 50% fewer graduates in 1996-97 than in 1979-80. Comparable data for the state of Arkansas and the United States are presented for reference at

FIGURE 2: COMPARISON OF CHANGES IN HIGH SCHOOL GRADUATES FOR SELECTED ARKANSAS COUNTIES, ARKANSAS, AND UNITED STATES, 1979-80 COMPARED TO 1985-86, 1988-89, 1990-91, AND 1996-97



the top of the figure. Note that the State of Arkansas fares much better during this period than does the nation as a whole. The figures for the United States are taken from the WICHE projections which do not extend far enough to provide 1996-97 projections.

Figure 3 presents comparisons of changes in projected numbers of high school graduates for eight regions of the state. The regions were selected for this report based on geographical relationships and patterns of changes in high school graduates projected at the county level. The years for which data are compared are the same as those in Figure 2.

The differences among the regions in the projected changes in high school graduates are quite striking. The north region has the highest projected increases while the east region has the largest projected decreases. Decreases are projected for all regions except the north region, although the northwest, southwest, and metropolitan regions fare as well or better than the state average. In addition to the larger decline in the east region, declines greater than the state average are projected for the northeast, south, and west central regions. The decline in the west central region is surprising, surrounded as it is by regions projected to fare as well or better than the state average.

Table 3 displays a comparison of ADHE projections of high school graduates for the State of Arkansas to the total of all ADHE county projections. The sums of the projections of high school graduates for the individual counties correspond fairly closely to the projections for the entire state. For all years except 1993-94, the totals of the projections for the individual counties exceed the projections for the entire state. The 1993-94 total of high school graduates projected for the individual counties is below that projected for the total state due to the data discrepancy in 1976 live births mentioned previously. The percentages of difference between the totals of the county projections and the projections for the entire state generally increase the further the projections extend into the future. The greatest variance is in 1994-95 when the total of the projections in the counties is 3.2% above the projection for the entire state. While all of the reasons for the variances between the totals of the projections for all of the counties and the projections for the entire state are not clear, the rounding practices should add more to the total of the projections for all of the counties since there are 75 times as many calculations involved as there are in the projections for the entire state. Finally, the differences also appear to be related to greater variations in ratios among the counties which are then cancelled to some extent when ratios for the entire state are calculated on the combined numbers.

The ADHE county high school graduate projections show significant variations in increases and declines among the counties and regions of the state. Major increases in high school graduates are projected for the northern counties and several which surround larger cities. The greatest projected declines in high school graduates are projected for eastern and southern counties as well as for rural counties which are neither northern nor contiguous to larger cities. Again, it should be stressed that while projecting high school graduates for individual counties for eighteen years is desirable, the larger variances in county migration, economic conditions and school practices dictate great restraint in utilization of the projections.

FIGURE 3: COMPARISON OF CHANGES IN HIGH SCHOOL GRADUATES FOR ARKANSAS REGIONS, ARKANSAS, AND UNITED STATES, 1979-80 Compared to 1985-86, 1988-89, 1990-91, and 1996-97

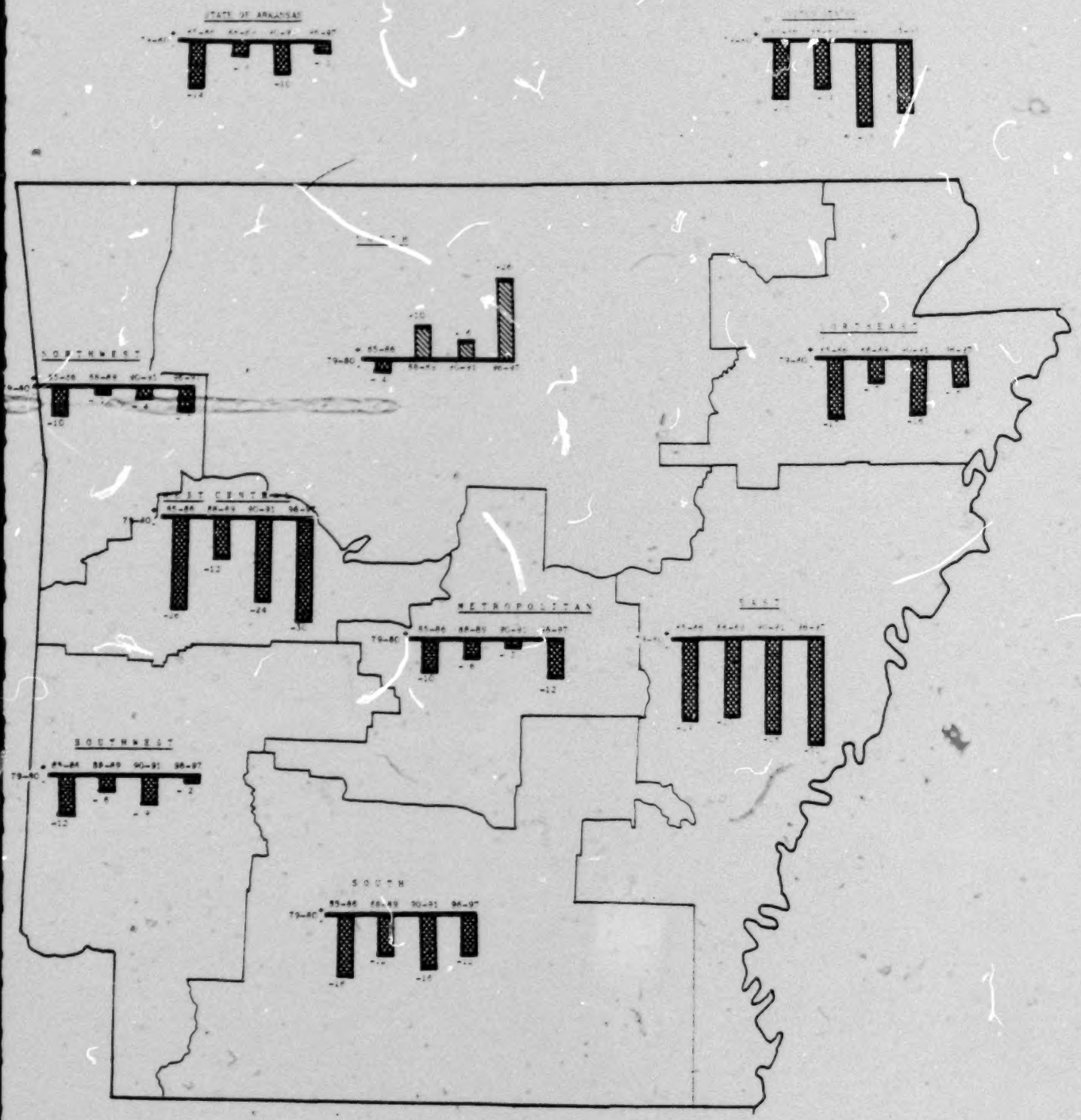


TABLE 3. COMPARISON OF ADHE PROJECTIONS OF HIGH SCHOOL GRADUATES FOR THE STATE OF ARKANSAS TO THE TOTAL OF ALL ADHE ARKANSAS COUNTY PROJECTIONS

	ADHE Projections for State	Total of ADHE County Projections	Difference	
			Numerical	Percent
1980-81	29,154	29,207	- 53	- 0.18
1981-82	29,411	29,485	- 74	- 0.25
1982-83	27,491	27,518	- 27	- 0.10
1983-84	26,347	26,368	- 21	- 0.08
1984-85	25,735	25,821	- 86	- 0.33
1985-86	25,114	25,221	- 107	- 0.43
1986-87	26,064	26,276	- 212	- 0.81
1987-88	27,095	27,384	- 289	- 1.07
1988-89	27,686	28,024	- 338	- 1.22
1989-90	26,757	27,114	- 357	- 1.33
1990-91	26,239	26,657	- 418	- 1.59
1991-92	26,869	27,460	- 591	- 2.20
1992-93	26,716	27,361	- 645	- 2.41
1993-94	27,005	26,790	+ 215	+ 0.80
1994-95	28,080	28,986	- 906	- 3.23
1995-96	27,080	27,634	- 554	- 2.05
1996-97	28,239	29,014	- 775	- 2.67

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REFERENCES

Condition of Education. National Center for Education Statistics. Washington, 1980.

High School Graduates: Projections for the Fifty States. Western Interstate Commission for Higher Education. Boulder, 1979.

APPENDIX

TABLE 4. STATE OF ARKANSAS, BIRTHS, PUBLIC SCHOOL YEAR ENROLLMENTS BY GRADE, GRADUATES, AND SURVIVAL RATIOS - ACTUAL THROUGH 1979-80, PROJECTED 1980-81 THROUGH 1995-96

SCHOOL YEAR	BIRTH YEAR	BIRTHS	RATIO FIRST GRADE/BIRTHS	GRADE 1	RATIO	GRADE 2	RATIO	GRADE 3	RATIO	GRADE 4	RATIO	GRADE 5	RATIO	GRADE 6	RATIO	GRADE 7	RATIO	GRADE 8	RATIO	GRADE 9	RATIO	GRADE 10	RATIO	GRADE 11	RATIO	GRADE 12	RATIO	GRADS.
74-75	1968			36,348		35,029		33,399		37,536		39,988		40,353		42,132		40,727		39,964		37,117		32,641		28,733		26,836
					.950		.987		1.003		1.005		1.012		1.041		.991		.986		.961		.907		.882			
75-76	1969	33,921	1.125	38,151		34,518		34,586		35,519		37,717		40,487		42,208		41,732		40,138		38,390		33,650		28,796	.939	27,029
					.937		.989		.998		1.004		1.012		1.045		.993		.991		.956		.893		.892			
76-77	1970	33,458	1.124	39,856		35,763		34,133		34,509		35,662		38,181		42,296		41,899		41,369		38,352		34,267		30,022	.943	27,719
					.941		.994		1.003		1.008		1.019		1.052		.993		.990		.946		.897		.897			
77-78	1971	33,828	1.148	41,115		37,515		35,555		34,220		34,789		36,326		40,163		42,013		41,487		39,737		34,414		30,754	.913	28,087
					.932		.986		.991		1.007		1.006		1.038		.974		.974		.934		.886		.891			
78-79	1972	33,715	1.167	39,344		38,301		36,972		35,243		34,447		34,999		37,690		39,103		40,924		38,748		34,680		30,649	.923	28,302
					.936		.983		.994		1.010		1.006		1.063		1.001		.993		.968		.911		.901			
79-80	1973	33,476	1.148	38,447		36,813		37,636		36,759		35,607		34,687		37,216		37,719		38,846		39,606		35,294		31,253	.920	29,052
Average Survival Ratios			1.142		.939		.988		.998		1.007		1.011		1.047		.990		.987		.953		.899		.893		.925	
80-81	1974	34,476		39,372		36,102		36,373		37,561		37,016		35,999		36,317		36,844		37,229		37,020		35,606		31,518		29,154
81-82	1975	34,279		39,147		36,970		35,669		36,300		37,824		37,423		37,691		35,934		36,365		35,479		33,281		31,796		29,411
82-83	1976	34,631		39,571		36,739		36,526		35,398		36,534		38,240		39,182		37,314		35,487		34,636		31,896		29,720		27,491
83-84	1977	36,029		41,145		37,157		36,318		36,453		35,847		36,956		40,037		38,790		36,829		35,819		31,156		28,695		26,547
84-85	1978	34,747		39,681		38,635		36,711		36,245		36,705		36,241		38,693		39,637		38,286		35,098		30,403		27,822		25,733
85-86	1979	36,234		41,379		37,260		38,171		36,638		36,499		37,112		37,944		38,306		39,122		36,487		31,553		27,150		25,114
86-87						38,853		36,813		38,095		36,894		36,900		38,836		37,563		37,808		37,283		32,802		28,477		26,064
87-88								38,389		36,739		38,362		37,300		38,634		38,467		37,077		36,031		33,317		29,292		27,095
88-89										38,312		36,996		38,784		39,033		38,248		37,967		35,334		32,392		29,931		27,686
89-90												38,580		37,403		40,607		38,662		37,751		36,183		31,765		28,926		26,757
90-91														39,004		39,161		40,291		38,159		35,977		32,529		28,366		26,239
91-92																40,837		38,769		39,678		36,366		32,343		29,048		26,869
92-93																		40,429		38,265		37,813		32,693		28,882		26,716
93-94																				39,903		36,467		33,994		29,195		27,005
94-95																						38,028		33,784		30,337		28,080
95-96																								34,187		29,276		27,080
96-97																										30,529		28,239

Prepared by Arkansas Department of Higher Education, April, 1981.

TABLE 5. COMPARISON OF CHANGES IN HIGH SCHOOL GRADUATES FOR ARKANSAS COUNTIES, ACTUAL 1979-80 COMPARED PROJECTED TO 1985-86, 1988-89, 1990-91, AND 1996-97

UNITED STATES	1985-86	1988-89	1990-91	1994-95
UNITED STATES	-16.8	-13.8	-25.4	-20.9
STATE OF ARKANSAS AND ARKANSAS COUNTIES	1985-86	1988-89	1990-91	1996-97
STATE OF ARKANSAS	-13.6	- 4.7	- 9.7	- 2.8
ARKANSAS COUNTIES				
ARKANSAS	-30.9	-23.2	-36.8	-27.0
ASHLEY	-14.3	- 3.5	-17.8	-11.1
BAXTER	+ 6.4	+32.5	+12.4	+74.9
BENTON	- 3.4	+13.5	+ 5.6	+ 1.4
BOONE	- 7.2	+16.9	+ 1.7	+18.1
BRADLEY	-23.7	-30.3	-28.0	-21.3
CALHOUN	-22.4	-21.5	-25.2	-17.8
CARROLL	-22.1	- 6.2	-15.9	+28.2
CHICOT	-23.9	-31.7	-30.9	-30.0
CLARK	-19.1	- 3.4	- 5.7	-18.7
CLAY	-23.9	-27.7	-33.7	-24.2
CLEBURNE	+ 5.2	+ 5.2	+18.0	+58.1
CLEVELAND	- 9.0	- 1.6	-22.1	-11.5
COLUMBIA	-28.6	-17.9	-30.8	-17.4
CONWAY	-14.0	+ 4.9	+14.4	+ 8.3
CRAIGHEAD	- 8.7	+ 9.3	- 5.1	+ 6.9
CRAWFORD	- 6.8	+ 3.7	+ 5.0	+51.3
CRITTENDEN	-19.3	-15.7	-22.1	-32.4
CROSS	-25.6	-17.2	-13.5	-24.7
DALLAS	-20.6	-13.1	-10.6	- 6.9
DESHA	-29.7	-27.3	-34.9	-26.7
DREW	-10.0	- 9.2	- 7.4	+ 3.1
FAULKNER	- 0.2	+30.0	+42.4	+48.0
FRANKLIN	-11.6	-10.4	+ 1.2	+ 5.8
FULTON	-12.9	- 2.4	-24.2	- 0.8
GARLAND	-17.7	- 9.3	-20.1	- 8.9
GRANT	- 6.9	+ 5.4	- 3.5	+15.8
GREENE	-19.8	- 3.0	-12.4	+16.1
HEMPSTEAD	- 2.5	+ 0.7	+ 1.8	+16.3
HOT SPRING	- 7.6	+ 4.1	- 6.0	+ 7.1
HOWARD	-32.0	-14.7	-16.0	- 9.1
INDEPENDENCE	+17.5	+24.2	+25.8	+40.5
IZARD	-22.5	-17.4	-11.6	- 4.4
JACKSON	-22.6	-23.0	-24.2	-20.2
JEFFERSON	-17.1	- 9.4	-11.0	-10.9
JOHNSON	- 1.6	+18.6	+17.5	+18.6
LAFAYETTE	-26.0	-16.0	-25.2	-19.9
LAWRENCE	-21.3	- 5.1	- 1.3	- 8.1
LEE	-22.9	-35.5	-38.8	-49.5

TABLE 5. (CONTINUED)

	1985-86	1988-89	1990-91	1996-97
LINCOLN	-32.3	-26.2	-29.2	-28.7
LITTLE RIVER	- 4.6	+ 0.9	+ 1.9	-11.6
LOGAN	-29.7	-18.6	-24.0	-29.7
LONOKE	- 6.8	+13.5	+ 7.7	+36.7
MADISON	-20.8	- 9.5	-20.8	- 2.4
MARION	+20.2	+32.6	+44.2	+62.8
MILLER	- 7.1	- 2.1	- 8.7	- 2.9
MISSISSIPPI	-15.0	- 7.8	-15.1	-15.0
MONROE	-17.1	-31.5	-25.0	-31.0
MONTGOMERY	- 3.6	+ 4.8	- 4.8	+ 1.2
NEVADA	-14.4	+ 0.7	+20.9	+ 7.8
NEWTON	- 4.6	+10.2	- 1.1	+23.9
OUACHITA	-17.7	-16.0	-27.5	-22.3
PERRY	- 8.1	+ 7.0	-12.8	-16.3
PHILLIPS	-25.7	-28.9	-36.1	-38.6
PIKE	-17.0	-16.3	+ 9.9	+ 5.7
POINSETT	-19.9	-15.5	-32.3	-30.1
POLK	+ 7.1	+ 1.0	- 7.1	+ 7.7
POPE	- 1.5	+ 3.9	+ 8.8	+ 4.1
PRAIRIE	-38.5	-28.9	-31.4	-44.9
PULASKI	-11.7	+ 2.6	- 0.7	+ 3.3
RANDOLPH	- 2.9	- 2.9	-11.2	+34.6
SALINE	-11.6	+ 5.7	- 8.7	+17.5
SCOTT	-21.0	-11.3	-36.3	-35.5
SEARCY	0.0	-11.2	-21.6	- 6.0
SEBASTIAN	-12.1	- 7.3	- 8.9	- 3.5
SEVIER	-12.6	- 3.8	- 3.1	+ 3.1
SHARP	-15.5	+16.8	+13.6	+51.4
ST. FRANCIS	-18.1	-22.3	-32.1	-26.8
STONE	+ 4.7	+ 1.6	+ 5.5	+26.6
UNION	-17.4	-14.3	-13.3	- 3.6
VAN BUREN	+21.6	+43.9	+35.3	+68.4
WASHINGTON	-11.3	- 4.3	-10.1	+ 3.0
WHITE	- 9.3	+ 4.9	- 1.8	+14.3
WOODRUFF	- 8.4	+ 2.3	+ 6.1	+ 4.6
YELL	-29.9	-11.8	-22.1	-30.7

TS:db
4/21/81